Listing of Claims:

1. – 10 (cancelled)

11. (currently amended) A method for downlink beamforming in a frequency-division-duplex wireless communications system comprising a base station with an antenna array defining a communication cell and terminals that are physically remote from said base station, the method comprising the steps of:

dividing the communication cell into a plurality of sectors;

identifying uplink nulls which would yield pseudo nulls in a sector;

constraining use of the system to those terminals in a sector in which no pseudo nulls will be generated;

receiving at said base station antenna array combinations of arriving signals from said plurality of remote terminals, each signal having a beam pattern incorporating a main beam and one or more nulls;

identifying an uplink beamforming weight for a signal;

generating a downlink beamforming weight based on the signal's uplink beamforming weight using the null constraint method, wherein the null constraint method comprises

determining an uplink beam pattern's nulls:

$$z_{u,k}(i),\ i = 1,\ \ldots,\ M-1,$$

using a polynomial formed from the uplink beamforming weight:

$$\sum_{i=1}^{M} w_{u,k}(i)\, z^{-i+1} = w_{u,k}(1)\left(1 - z_{u,k}(1)\, z^{-1}\right)\ldots\left(1 - z_{u,k}(M-1)\, z^{-1}\right);$$

transforming phase components of the uplink beam pattern's nulls and obtaining phase components of a downlink beam pattern's nulls as:

$$\varphi_{d,k}(i) = \frac{f_d}{f_u}\varphi_{u,k}(i),\ where\ z_{u,k}(i) = A_{u,k}(i)\, e^{j\varphi_{u,k}(i)},$$

for i = 1,..., M-1; and

constructing the downlink beam pattern's nulls:

$$z_{d,k}(i) = A_{d,k}(i)\, e^{j\psi_{d,k}(i)}\ ,for\ i = 1,\ \ldots,\ M-1;$$

and constructing the downlink beamforming weight:

$$\sum_{i=1}^{M} w_{d,k}(i)\, z^{-i+1} = w_{d,k}(1)\left(1 - z_{d,k}(1)\, z^{-1}\right)\ldots\left(1 - z_{d,k}(M-1)\, z^{-1}\right);$$

and

transmitting downlink signals using downlink beamforming weights.

12. – 13. (cancelled)

14. (currently amended) A base station for a wireless communications system, the base station comprising:

an uplink receiver antenna array for receiving arriving signals from a plurality of remote terminals on respective uplink channels;

a downlink weight generator operable to generate downlink weights based on a signal's uplink beamforming weight using the null constraint method;

a downlink transmit antenna array to transmit signals to the remote terminals in accordance with the generated downlink weights, the transmission cell of the antenna array being divided into a plurality of sectors;

means to identify uplink nulls which would yield pseudo nulls in a sector; and

means to constrain use of the system to those terminals in a sector in which no pseudo nulls will be generated, wherein the null constraint method comprises

determining an uplink beam pattern's nulls:

$$z_{u,k}(i),\ i = 1,\ \ldots,\ M-1,$$

using a polynomial formed from the uplink beamforming weight:

$$\sum_{i=1}^{M} w_{u,k}(i)\, z^{-i+1} = w_{u,k}(1)\left(1 - z_{u,k}(1)\, z^{-1}\right)\ldots\left(1 - z_{u,k}(M-1)\, z^{-1}\right);$$

transforming phase components of the uplink beam pattern's nulls and obtaining phase components of a downlink beam pattern's nulls as:

$$\varphi_{d,k}(i) = \frac{f_d}{f_u}\, \varphi_{u,k}(i),\ where\ z_{u,k}(i) = A_{u,k}(i)\, e^{j\varphi_{u,k}(i)},$$

for i = 1,..., M-1; and

constructing the downlink beam pattern's nulls:

$$z_{d,k}(i) = A_{d,k}(i)\, e^{j\psi_{d,k}(i)}, for\; i = 1, \ldots, M-1;$$

and constructing the downlink beamforming weight:

$$\sum_{i=1}^{M} w_{d,k}(i)\, z^{-i+1} = w_{d,k}(1)\left(1 - z_{d,k}(1)\, z^{-1}\right)\ldots\left(1 - z_{d,k}(M-1)\, z^{-1}\right).$$

15. – 16. (canceled)

17. (original) A communication system incorporating a base station according to claim 14 and a plurality of remote terminals.

18. (cancelled)